LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-2 (canceled)

Claim 3 (currently amended)

~~The integrated circuit of claim 2,~~ An integrated circuit for controlling a power supply circuit which delivers power to a load circuit that includes a fluorescent lamp, comprising:

ballast control and drive circuitry that provides drive signals to the power supply circuit, that receives sense signals indicating operating conditions of at least one of the power supply circuit and the load circuit, and that responds to the sense signals by modifying the drive signals; and including

adaptive zero-voltage-switching and minimum-current-switching (ZVMCS) circuitry, wherein said ZVMCS circuitry senses an output of said power supply circuit and in response thereto, controls said drive circuitry to maintain said power supply circuit under ZVMCS conditions;

wherein the power supply circuit includes a half-bridge circuit with low and high side power devices, the drive signals including low side drive signals to control the low side power device and high side drive signals to control the high side power device; the ballast control and drive circuitry including a low side drive output for providing the low side drive signals to the low side power device and a high side drive output for providing the high side drive signals to the high side power device; and

wherein said ZVMCS circuit senses an output voltage of said half-bridge circuit between said high side and low side power devices at a switching time of one of said power devices, and controls said drive signals so as to maintain said output voltage near or at zero at said switching time.

Claim 4 (currently amended)

~~The integrated circuit of claim 2,~~ An integrated circuit for controlling a power supply circuit which delivers power to a load circuit that includes a fluorescent lamp, comprising:

ballast control and drive circuitry that provides drive signals to the power supply circuit, that receives sense signals indicating operating conditions of at least one of the power supply circuit and the load circuit, and that responds to the sense signals by modifying the drive signals; and including

adaptive zero-voltage-switching and minimum-current-switching (ZVMCS) circuitry, wherein said ZVMCS circuitry senses an output of said power supply circuit and in response thereto, controls said drive circuitry to maintain said power supply circuit under ZVMCS conditions;

wherein the power supply circuit includes a half-bridge circuit with low and high side power devices, the drive signals including low side drive signals to control the low side power device and high side drive signals to control the high side power device; the ballast control and drive circuitry including a low side drive output for providing the low side drive signals to the low side power device and a high side drive output for providing the high side drive signals to the high side power device; and

wherein said ZVMCS circuit senses an output current of said half-bridge circuit between said high side and low side power devices at a switching time of one of said power devices, and controls said drive signals so as to maintain said output current near or at zero at said switching time.

Claim 5 (currently amended)

~~The integrated circuit of claim 1,~~ An integrated circuit for controlling a power supply circuit which delivers power to a load circuit that includes a fluorescent lamp, comprising:

ballast control and drive circuitry that provides drive signals to the power supply circuit, that receives sense signals indicating operating conditions of at least one of the

power supply circuit and the load circuit, and that responds to the sense signals by modifying the drive signals; and including

adaptive zero-voltage-switching and minimum-current-switching (ZVMCS) circuitry, wherein said ZVMCS circuitry senses an output of said power supply circuit and in response thereto, controls said drive circuitry to maintain said power supply circuit under ZVMCS conditions;

wherein said load circuit has a resonant frequency;

said drive circuitry controls said power supply circuit to supply power at an operating frequency; and

said ZVMCS circuitry controls said drive circuitry to maintain said operating frequency at or near said resonant frequency.

Claim 6 (original)

The integrated circuit of claim 5, wherein said operating frequency is maintained above but near said resonant frequency.

Claim 7 (original)

The integrated circuit of claim 5, wherein the power supply circuit includes a half-bridge circuit with low and high side power devices, the drive signals including low side drive signals to control the low side power device and high side drive signals to control the high side power device; the ballast control and drive circuitry including a low side drive output for providing the low side drive signals to the low side power device and a high side drive output for providing the high side drive signals to the high side power device; and

said ZVMCS circuit senses an output voltage of said half-bridge circuit between said high side and low side power devices at a switching time of one of said power devices, and controls said drive signals so as to maintain said output voltage near or at zero at said switching time.

Claim 8 (original)

The integrated circuit of claim 7, wherein said ZVMCS circuit senses an output current of said half-bridge circuit between said high side and low side power devices at a switching time of one of said power devices, and controls said drive signals so as to maintain said output current near or at zero at said switching time.

Claim 9 (original)

The integrated circuit of claim 5, wherein said operating frequency of said drive circuitry is determined by a voltage-controlled oscillator (VCO), and said ZVMCS circuitry determines a control voltage supplied to said VCO.

Claim 10 (original)

The integrated circuit of claim 9, wherein said ZVMCS circuitry increases said control voltage in order to increase said operating frequency.

Claim 11 (original)

The integrated circuit of claim 10, wherein said control voltage is supplied by an input capacitor of said VCO, and said ZVMCS circuitry charges said capacitor to a higher voltage in order to increase said operating frequency.

Claim 12 (original)

The integrated circuit of claim 11, wherein said ZVMCS circuitry charges said capacitor by turning on a switching device in order to supply a charging current to said capacitor.

Claim 13 (canceled)

Claim 14 (currently amended)

~~The integrated circuit of claim 13,~~ An integrated circuit for controlling a power supply which delivers power to a load circuit that includes a fluorescent lamp, comprising:

ballast control and drive circuitry that provides drive signals to the power supply circuit, that receives sense signals indicating operating conditions of at least one of the power supply circuit and the load circuit, and that responds to the sense signals by modifying the drive signals;

the ballast control and drive circuitry further having a set of modes in any of which it can operate, the ballast control and drive circuitry making transitions between the modes in response to the sense signals; and including

adaptive zero-voltage-switching and minimum-current-switching (ZVMCS) circuitry, wherein said ZVMCS circuitry senses an output of said power supply circuit and in response thereto, controls said drive circuitry to maintain said power supply circuit under ZVMCS conditions;

in which the modes include an under-voltage lockout mode, a frequency sweep mode, an adaptive mode and a fault mode.

Claim 15 (currently amended)

~~The integrated circuit of claim 13,~~ An integrated circuit for controlling a power supply which delivers power to a load circuit that includes a fluorescent lamp, comprising:

ballast control and drive circuitry that provides drive signals to the power supply circuit, that receives sense signals indicating operating conditions of at least one of the power supply circuit and the load circuit, and that responds to the sense signals by modifying the drive signals;

the ballast control and drive circuitry further having a set of modes in any of which it can operate, the ballast control and drive circuitry making transitions between the modes in response to the sense signals; and including

adaptive zero-voltage-switching and minimum-current-switching (ZVMCS) circuitry, wherein said ZVMCS circuitry senses an output of said power supply circuit and in response thereto, controls said drive circuitry to maintain said power supply circuit under ZVMCS conditions;

wherein said integrated circuit has eight pins;

four pins being connected to said drive circuitry;

two pins being connected to a power supply and a return; and

two pins being used for setting an operating frequency of said drive circuitry.

Claim 16 (original)

The integrated circuit of claim 15, wherein said operating frequency of said drive circuitry is determined by a voltage-controlled oscillator (VCO), and a control voltage is supplied to said VCO by an input capacitor connected to one of said two pins for setting an operating frequency.

Claim 17 (original)

The integrated circuit claim of 16, wherein the other one of said two pins is used to set a minimum frequency of said VCO.

Claim 18 (original)

The integrated circuit of claim 16, wherein said ZVMCS circuitry sets said control voltage by controlling a charge on said input capacitor of said VCO.

Claim 19 (canceled)

Claim 20 (original)

~~The method of claim 19, in which~~ A method for controlling a power supply circuit which delivers power to a load circuit that includes a fluorescent lamp, comprising the steps of:

providing drive signals to the power supply circuit, receiving sense signals indicating operating conditions of at least one of the power supply circuit and the load circuit, responding to the sense signals by modifying the drive signals; and

adaptively maintaining zero-voltage-switching and minimum-current-switching (ZVMCS), by sensing an output of said power supply circuit and in response thereto, controlling said drive signals to maintain said power supply circuit under ZVMCS conditions;

wherein the power supply circuit includes a half-bridge circuit with low and high side power devices, the drive signals including low side drive signals to control the low side power device and high side drive signals to control the high side power device; and

wherein said ZVMCS conditions are maintained by sensing an output voltage of said half-bridge circuit between said high side and low side power devices at a switching time of one of said power devices, and controlling said drive signals so as to maintain said output voltage near or at zero at said switching time.

Claim 21 (currently amended)

~~The method of claim 20,~~ A method for controlling a power supply circuit which delivers power to a load circuit that includes a fluorescent lamp, comprising the steps of:

providing drive signals to the power supply circuit, receiving sense signals indicating operating conditions of at least one of the power supply circuit and the load circuit, responding to the sense signals by modifying the drive signals; and

adaptively maintaining zero-voltage-switching and minimum-current-switching (ZVMCS), by sensing an output of said power supply circuit and in response thereto, controlling said drive signals to maintain said power supply circuit under ZVMCS conditions;

wherein the power supply circuit includes a half-bridge circuit with low and high side power devices, the drive signals including low side drive signals to control the low side power device and high side drive signals to control the high side power device; and

wherein said ZVMCS conditions are maintained by sensing an output current of said half-bridge circuit between said high side and low side power devices at a switching

time of one of said power devices, and controlling said drive signals so as to maintain said output current near or at zero at said switching time.

Claim 22 (currently amended)

~~The method of claim 19,~~ A method for controlling a power supply circuit which delivers power to a load circuit that includes a fluorescent lamp, comprising the steps of:

providing drive signals to the power supply circuit, receiving sense signals indicating operating conditions of at least one of the power supply circuit and the load circuit, responding to the sense signals by modifying the drive signals; and

adaptively maintaining zero-voltage-switching and minimum-current-switching (ZVMCS), by sensing an output of said power supply circuit and in response thereto, controlling said drive signals to maintain said power supply circuit under ZVMCS conditions;

wherein said load circuit has a resonant frequency;

said power supply circuit supplies power at an operating frequency; and

said operating frequency is maintained at or near said resonant frequency.

Claim 23 (original)

The method of claim 22, wherein said operating frequency is maintained above but near said resonant frequency.

Claim 24 (original)

The method of claim 22, in which the power supply circuit includes a half-bridge circuit with low and high side power devices, the drive signals including low side drive signals to control the low side power device and high side drive signals to control the high side power device; wherein said ZVMCS conditions are maintained by sensing an output voltage of said half-bridge circuit between said high side and low side power devices at a switching time of one of said power devices, and controlling said drive signals so as to maintain said output voltage near or at zero at said switching time.

Claim 25 (original)

The method of claim 24, wherein said ZVMCS conditions are maintained by sensing an output current of said half-bridge circuit between said high side and low side power devices at a switching time of one of said power devices, and controlling said drive signals so as to maintain said output current near or at zero at said switching time.

Claim 26 (original)

The method of claim 22, wherein said operating frequency is determined by a voltage-controlled oscillator (VCO), and comprising the step of controlling a control voltage supplied to said VCO.

Claim 27 (original)

The method of claim 26, wherein said control voltage is supplied by an input capacitor of said VCO, and comprising the step of controlling a charge on said capacitor in order to set said operating frequency.

Claim 28 (new)

The integrated circuit of claim 5, wherein the power supply circuit includes a half-bridge circuit with low and high side power devices, the drive signals including low side drive signals to control the low side power device and high side drive signals to control the high side power device; the ballast control and drive circuitry including a low side drive output for providing the low side drive signals to the low side power device and a high side drive output for providing the high side drive signals to the high side power device; and

said ZVMCS circuit senses an output current of said half-bridge circuit between said high side and low side power devices at a switching time of one of said power devices, and controls said drive signals so as to maintain said output current near or at zero at said switching time.

Claim 29 (new)

The method of claim 22, in which the power supply circuit includes a half-bridge circuit with low and high side power devices, the drive signals including low side drive signals to control the low side power device and high side drive signals to control the high side power device; wherein said ZVMCS conditions are maintained by sensing an output current of said half-bridge circuit between said high side and low side power devices at a switching time of one of said power devices, and controlling said drive signals so as to maintain said output current near or at zero at said switching time.